HIBBERD (Jas. F.)

THE RELATIONS OF MATTER AND MIND.

Read at the Annual Meeting of the Indiana State Medical Society, May 16, 1894.

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RICHMOND, IND.

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THE RELATIONS OF MATTER AND MIND.

In the near future the most important and useful progress in medicine will be along biologic lines. Biology is the science of living things; in the broader sense covering all vital processes; teaches the phenomena concerning the genesis, the development, decline and death of all vital organisms.

To my mind it is a self-evident proposition that a physician should fully understand the cytogenesis, the morphology, the histology, the anatomy, the physiology and the pathology of man, and as man is a microcosm of animated nature it is but a corollary that a perfect physician must be a thorough biologist.

In the matter of the biology of the human mind there is abroad a great popular misunderstanding, and I am apt to believe that physicians have not given such attention to the relations of matter and mind as to leave no shadow of dubiety in the premises in their own minds.

No student of current mental conditions has failed to recognize the difficulty of accounting for the incongruities of mental manifestations met with in all classes of people, and certainly no physician of experience but has been puzzled in many instances to draw the line between physical disease and so-called mind disorders. Much of the uncertainty in these cases is due to the fact that we have not sufficiently mastered the physics or the functions of the nervous organization in which the mind originates. In this state of knowledge it has been beyond our ability to point out definitely the true relation to hypnotism, to spiritualism, clairvoyance, Christian science, faith cures and a long list of similar disturbances to ordinary normal mental operations. It is my contention

that all these are understandable erratic operations of the mind as emanating from the nervous organization, and it is the intent of this dissertation to indicate how I arrive at this conclusion. I beg to premise that in this study the definition of psychology is restricted to its etymologic signification, to-wit, the science of the soul, quite a distinct thing from the somatic mind as herein elucidated, and that in this discussion I do not enter the realm of psychology.

When one attempts the analysis of the relation of matter and mind by a study of it, as it exists in the human adult, one fails of success most signally. The relation here is so involved, its manifestations so diverse, so extensive and apparently so mysterious that its essential nature can not be made out by such a study, and yet this has been almost the exclusive field cultivated by investigators of metaphysics since the time of Aristotle with the constant result of endless disagreements and confounding confusion. Accordingly, for a satisfactory elucidation of this relation we must pass the schoolmen, depart from scholasticism, and make use of modern scientific methods of investigating involved problems, devoting ourselves to seeking the simplest form in which the relation of matter and mind exhibits itself and following its development, step by step, in its ascending scale until it reaches its maximum in enlightened man.

The amœba is the lowest organism that exhibits the essential characteristics of animal life and its genesis is in protoplasm. The amœba is conceded on all hands to be an animal, and I will seek in it the first link of the chain of nervous energy that extends through all forms of animal development up to man, and still continues to extend in man as witnessed in his expanding knowledge and increasing enlightenment. The amœba is a single cell whose habitat is water containing protoplasm, and at rest and not under pressure, is globular. If it desires food it

projects from its surface a pseudopod, a finger-like process, from its general substance. If this feeler finds nothing the animal wants, the pseudopod is retracted into the general mass of the amœba. This may be repeated indefinitely and from any part of the cell, and when the pseudopod finds something seemingly suitable to its needs the body of the amœba follows up the pseudopod, and if the something, on examination, turns out to be a morsel of food, laps itself about the morsel, secretes a digestive juice, dissolves and absorbs the nutritious part of it, then unwraps its body and releases the indigestible refuse. When sufficiently developed to procreate its species the amœba divides by fission, making two organisms with identical structure and functions, each of which follows precisely the same career as the parent and has posterity in like manner to continue the family.

Here, then, is an animal of low degree, representing in minature all the essential phenomena of the most exalted animal creation; *e. g.*, it has volition—it wills to move and at once projects a pseudopod; it has judgment—it meets a morsel of something, seizes and examines it; if found to be food appropriates it, if not food discards it; it has secretion and absorption —it pours out a digestive fluid, dissolves its food into a peptone which it absorbs and assimilates; it has growth and reproduction—it develops by appropriating food, and reaching the procreative stage, divides, creating two amœba. Are not these functions of the amœba all of the essential functions of human beings? Are not the differences between the amœba and man, differences of degree and mode of manifestation and not of kind? Does not the amœba, a single microscopic cell of undifferentiated protoplasm, exhibit in every part of its organism all the attributes that promote the life and perpetuate the species of man who is but a community of untold billions of cells differentiated into departments and organs, such that each function has its assigned cells to perform every special service? In short, if man

is a microcosm of the cosmos, is not the amœba with equal appropriateness a microcosm of the man?

If protoplasm is the blastema of the amœba whence comes protoplasm? To answer this basic query, I must call attention to leading facts in the dynamics of physics operating to fashion the world as we find it, such as will indicate my line of argument. I must, however, confine my rehearsal to some of the more salient points; to recite all that would support my contention would require a volume, while my privileges of time and space will be exhausted in a few paragraphs.

There are about seventy elements that constitute the world, but only a small percentage of them are met with in a simple or uncombined state. These elements the Creator has made up of atoms and has endowed the atoms with ceaseless oscillatory motion. When the atoms of two elements are conjugated under chemic affinity a new substance is formed, wherein each element has lost its distinctive atoms and motions, forming molecules that have their distinctive characteristics. These new substances are subject to the law of chemic affinity and are as ready to conjugate under proper conditions as were their parent elements, and thus these conjugations go on almost *ad infinitum*. Those continuing conjugations of atoms and molecules are the effect of a primal law of the Creator impressed upon matter in the beginning, the mandate being that neither atom nor molecule shall ever rest, and by reason of perpetual motion shall work perpetual progress. Every step in this progress modified the environment and every modification of the environment invited phases of the conjugation of molecules not possible under any previous condition. When these progressive conjugations had continued for eons, the face of our globe had reached a condition wherein four of the elements, to-wit, oxygen, hydrogen, nitrogen and carbon combined to form a semi-fluid, slimy mass and this slime was primary protoplasm. The primal law of prog-

ress, forcible as ever, wrought modifications in this protoplasm and in time a speck of it segregated and became a cell in which was manifested an advanced phase of matter in motion, known as vital activity, notable in that the cell absorbed surrounding material and converted it into its own substance. This is a point to claim acutest attention. It marks the first step in the operation of the primal law of matter and motion beyond the simple, never-failing conjugation of atoms and molecules whenever conditions favored. and always in definite proportions and with unvarying results limited to the act of union. True, this first step was but a slight departure; the surrounding material from which the new-born cell absorbed its pabulum was the protoplasm from which it was just segregated, which, already cognate, required but slight assimilation to become identical with the cell substance, but, nevertheless, this step was the initial one in the mode of motion in matter that has produced all the marvelous forms and colors and motions of the vegetable kingdom, as well as the still more wondrous developments in the animal kingdom.

The initial cell was without a nucleus and was known as a moner, but the energy creating it continuing, further developments followed, a nucleus was formed, presently more elements were incorporated completing the plasm of the amœba which then appeared. Nor did harmonious progress halt or waver with the amœba; development continued in it until its congeners were many.

Thus was the amœba born, and further progress of animal organisms to higher classes was by the aggregation of cells in greater and greater numbers and their differentiation into organs and systems for special but associated service. As has been illustrated, the amœba was undifferentiated protoplasm but it had voluntary motion, exercised equally by every part of its body, while in the higher animals motion is the service of the muscular tissue. The amœba had secretion but no glands; in the higher

animals are many secretions, each produced by a special glandular structure. It exhibited consentient autonomy in all its parts; this is secured in the higher animals only through the most intricate nervous organization. With the increase of associated cells and differentiation of function in the more than 300,000 species of the animal kingdom, the development of the nervous system progresses *pari passu* with the other systems and, finally, in man it still continues its evolution, at least of function, while all other cognate departments appear to have attained their limits. As a whole, the scale of progress has been uniform—there are no cataclysmic phenomena in biology. There are, however, needs of animals that have caused the cultivation and achievement of special diversions of nervous energy with corresponding development of cells to answer the demand, *e. g.*, the eagle can see its prey from an unknown elevation; the dog can follow a selected scent when mingled with numerous other closely related scents, and so on. Even in different individuals of the same species there are marked divergences from the average normal, illustrated in the arithmetical juvenile prodigy who adds up five columns of four digits each, at the same time, and in the musical monstrosity known as "Blind Tom." All these specialized sense developments are due to the influence of the environment on the direction the primal energy in matter and motion may take when acting through protoplasm.

In the further consideration of the relations of matter and somatic mind, we will abandon the anatomy of the nervous system and study its physiology, adopting the classification of Hulings Jackson who divides it into lowest, middle and highest levels. The lowest level is the old spinal system of Marshall Hall, composed of centers that preside over the automatic activities of the body. The middle level consists of the motor area of Ferrier and others, in the central cortical region of the hemispheres. The

highest level is represented in the anterior and posterior regions of the hemispheres and, like the centers of the other levels is sensori-motor. The centers of the lowest level may act independently of the centers above it. The centers of the middle level can act independently of the highest centers but are necessarily associated with the centers of the lowest level. The highest level is the supreme commandant of the nervous system, but its centers can only exercise physical force through the centers of the levels below it. Its marked distinctness is being the seat of the somatic mind, and the anterior region of the hemispheres is more specialized in this behalf than the posterior, where the mixed motor function predominates.

In this connection it is important to understand that the brains of men differ in form, size and force one from all others, as the bodies of men differ in form, size and force, one from all others, and in like manner the sundry regions of the brain differ as the sundry organs of the body differ; in short, as there are no two human bodies precisely alike, so there are no two human brains precisely alike, and by the same token no two somatic minds alike.

The mind is made up of departments or sections that usually act in more or less harmonious concert but may, and in truth do often, manifest exalted function in one department and depressed activity in another department, and these varying conditions frequently change under changing environment and stimulation. If we gain a clear concept of these pregnant facts we will have but little trouble in understanding that the occult mental phenomena, claimed as a special endowment of supernal power is simply the unbalanced erratic activity of a perturbed physical brain.

In numerous instances one department of the mind has been exalted, with apparently a corresponding and related depression in another department, and under this condition the functioning of the stimu-

lated center is so intense that it overrides the function of other centers of the highest level, indeed dominates them all to the extent of suppressing all consciousness of every act not under the dominion of the excited center, as *e. g.*, in catalepsy, somnambulism, hypnotism and numerous minor and more transient manifestations during excited passions. In other instances, several centers have undue functioning and together disturb the average normal activity of the mind, inducing hysteria, spiritualism, clairvoyance, Christian science and quite a catalogue of other morbid conditions of varying intensity and duration, covering the superstitions of the world, countless in number and inconceivably discordant in form, extent and direction.

These errors of function of the intellectual nerve cells of the anterior region of the cerebral hemispheres are not always of this gross and distinct character, indeed, generally, they are in the first departure an almost imperceptible step, a mere shading of error, growing deeper and darker in many sad instances, until the somatic mind is entirely obliterated.

The etiology of these erratic phases of the somatic mind is as varied as the manifestations and not constant in any number of them. The physical structure of man is not identical in any two persons and the nervous tissue, both macroscopic and microscopic is morphologically as irregular as other systems; this undoubtedly accounts entirely for some of the defects of function and is a coadjutor more or less potent in many.

The environment is responsible for much that presents in these cases, teaching both by observed example and covert influence. The inmates of a French juvenile institution suffered from an invasion of catalepsy, epileptiform seizures and other neuroses, and the distemper was arrested only by the exhibition of incandescent metal instruments prepared to cauterize the next victim of the disorder. But in no case

are such derangements either induced or relieved by the will power of one person over another, except through spoken word or suggestive motion. The greatest misconception touching hypnotism arises from the widely entertained popular belief that a hypnotist can control a hypnotee by will power alone, whereas it has been abundantly proven that the hypnotist can not influence the hypnotee through the exercise of unassisted will power, but only through present suggestion or previous arrangement.

In the history of the amœba it was shown that the cell exercised the attributes of a living animal by all parts of its protoplasm, and that the development of the higher animals, including man, was by an increase of cells and their association and differentiation into tissues, organs and systems each with special functions. It is, however, important to understand that in the increase of cells and increase of better defined function the individual cells retained something of the original attributes and attitude of the amœba, illustrated in man as in all the higher animals, by the fact that the cells of every tissue select the pabulum for the tissue from the general supply; thus the cells of bone select from the current of blood the material for bone, absorb and convert it into bone; the cells of muscle select the appropriate instrument for muscular tissue and transform it into muscle; and the nerve cells arrest from the circulation only the substances to maintain nervous tissue; and in all these instances this service is performed by virtue of the inherent discriminating energy of the cells independently of the highest, the middle or the lowest levels of the nervous system; this energy being the lineal descendant through protoplasm and the amœba of the primal energy of matter in motion, here, as in all intermediate organisms between moner and man, modified by the surroundings, and harmonized by the higher nervous levels of the system.

In all past time, the origin and nature of conscious-

ness has been the most abstruse problem in metaphysiology. The origin of mental energy in man, inculcated in this dissertation, affords a solution of the problem. Neither the amœba nor the cells of the tissues of man can seize the floating particle of matter, examine it, and decide whether or not it is fit for food without knowing the particle was there and the purpose for which it was examined, and knowing is an act of consciousness. The difference between their consciousness and that arising from the anterior convolutions of the hemispheres is one of degree and not of kind. The former is evanescent, serves its purpose for the occasion and vanishes unregistered; the latter is permanent, always ready for action while the brain is intact and registers its service in the memory.

Do not these converging testimonies focus the truth in the proposition that the somatic mind of man is clearly enough the highest manifestation and legitimate sequence of the operation of the primal law of matter and motion, impressed by the Creator in the beginning on the elements of the earth?